

STUDENT NUMBER

Figures

Words

Letter

# PSYCHOLOGY

## Written examination 2

Thursday 4 November 2010

Reading time: 9.00 am to 9.15 am (15 minutes)

Writing time: 9.15 am to 10.45 am (1 hour 30 minutes)

## QUESTION AND ANSWER BOOK

### Structure of book

Section	Number of questions to be answered	Number of marks
A	44	44
B	16	46
		Total 90

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape.
- No calculator is allowed in this examination.

### Materials supplied

- Question and answer book of 20 pages.
- Answer sheet for multiple-choice questions.

### Instructions

- Write your student number in the space provided above on this page.
- Check that your name and student number as printed on your answer sheet for multiple-choice questions are correct, and sign your name in the space provided to verify this.
- All written responses must be in English.

### At the end of the examination

- Place the answer sheet for multiple-choice questions inside the front cover of this book.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

## AREA OF STUDY 2 – LEARNING

### Question 23

A fixed-action pattern is a useful behaviour because it

- is species specific.
- prevents cross-mating of species.
- does not depend on a reflex response.
- ensures the animal has the capacity to meet a survival need.

### Question 24

It is not generally possible to 'teach' a baby to crawl earlier than normal because

- crawling is a complex behaviour.
- a baby cannot respond to reinforcement.
- a baby is unable to comprehend complex instructions.
- crawling is due to maturation.

### Question 25

In classical conditioning, learning is said to have occurred when

- the conditioned stimulus and unconditioned stimulus have had several pairings.
- the neutral stimulus produces the unconditioned response on every occasion it is presented.
- the conditioned stimulus produces the conditioned response in the absence of the unconditioned stimulus.
- the unconditioned stimulus becomes the conditioned stimulus and consistently produces the conditioned response.

The following information relates to Questions 26–29.

Every time Robert opened a can of dog food in the laundry, his new puppy Max responded by turning around in circles and barking. After a couple of weeks, Robert noticed that Max turned around in circles and barked every time Robert went into the laundry, even if he did not have the can-opener or the dog food with him.

### Question 26

Before conditioning, Robert going into the laundry was the

- neutral stimulus.
- conditioned stimulus.
- conditioned response.
- unconditioned response.

### Question 27

After conditioning, Max's behaviour of turning around in circles and barking was the

- neutral stimulus.
- conditioned stimulus.
- conditioned response.
- unconditioned response.

**Question 28**

Robert noticed that Max did not turn around in circles and bark when Robert's mother went into the laundry. This is an example of

- A. extinction.
- B. stimulus generalisation.
- C. stimulus discrimination.
- D. unconditioned behaviour.

**Question 29**

When Max was three months old he was moved into a kennel outside and Robert started opening Max's food outside instead of in the laundry. After a week Robert noticed that Max no longer turned around in circles or barked when he saw Robert going into the laundry.

This is an example of

- A. extinction.
- B. stimulus generalisation.
- C. stimulus discrimination.
- D. unconditioned behaviour.

**Question 30**

In classical conditioning, spontaneous recovery occurs when

- A. a previously conditioned response reappears after a period of extinction.
- B. a behaviour similar to a previously conditioned response emerges after a period of time.
- C. a previously learned conditioned stimulus-unconditioned stimulus association is learned more quickly in a second acquisition phase.
- D. a previously conditioned response initially increases during the process of extinction.

**Question 31**

Antabuse is a drug which can be used to treat alcoholism. When it is taken together with alcohol, it immediately causes nausea and vomiting, and stops the patient wanting alcohol.

In this case, the treatment with Antabuse is a form of

- A. one trial learning – taste aversion.
- B. classical conditioning – extinction.
- C. one trial learning – stimulus discrimination.
- D. classical conditioning – negative reinforcement.

**Question 32**

Punishment could be said to unintentionally reinforce undesirable behaviour if

- A. the punishment produces an unwanted aggressive response.
- B. the punishment does not immediately follow the undesirable behaviour.
- C. desirable behaviour replaces the undesirable behaviour following the punishment.
- D. undesirable behaviour is increased due to the attention received through punishment.

*The following information relates to Questions 33 and 34.*

Maryanne worked hard with her kindergarten class to teach them to say 'please' and 'thank you'. Maryanne rewarded the students by saying 'well done' each time they said 'please' or 'thank you' at an appropriate time. After a week, Maryanne decided the class knew how to use these words correctly and stopped saying 'well done'. After a couple of weeks, she noticed that the students no longer said 'please' and 'thank you'.

**Question 33**

This is most likely because

- A. Maryanne did not punish the students.
- B. a learned response will become extinct if it is not reinforced.
- C. the students discriminated between saying 'please' and 'thank you' and getting a reward.
- D. Maryanne used a fixed-ratio schedule of reinforcement which is not as effective as a fixed-interval schedule.

**Question 34**

Another strategy Maryanne used was to keep the students indoors, when they wanted to play outside, until they used the words 'please' and 'thank you'.

This is an example of

- A. shaping.
- B. punishment.
- C. positive reinforcement.
- D. negative reinforcement.

**Question 35**

Melissa had always wanted to be a teacher. When she became a student teacher she spent two weeks watching a qualified teacher with a class of Year 9 students. Melissa carefully observed the techniques that the teacher used to manage the class. However, when Melissa took over she was unable to control the class.

In terms of observational learning, which of the following is the most likely reason for Melissa's inability to put into practice what she had learned by watching the teacher?

- A. Melissa did not pay sufficient attention to what the teacher was doing.
- B. Melissa was not motivated to learn how to manage the class.
- C. The teacher did not provide Melissa with reinforcement for managing the class.
- D. Melissa remembered what she had observed when she watched the teacher manage the class but did not have the ability to do it herself.

**Question 36**

The main conclusion to be drawn from Bandura's Bo-Bo doll experiments with observational learning in children is that learning

- A. is not dependent on operant conditioning.
- B. occurs through a process of trial and error.
- C. can occur in the absence of direct reinforcement or punishment.
- D. involves the positive transfer of learning from the model to the observer.

**Question 37**

A researcher conducted an experiment with a group of rats in a maze. The rats learned to find their way around the maze in order to receive a food pellet at the end. The researcher concluded that the rats had learned to find the pellet at the end of the maze through trial and error.

She drew this conclusion because

- A. the rats made a number of incorrect choices before determining the correct route to the food pellet.
- B. the rats received reinforcement from seeing the other rats succeed in the maze and reach the food pellet.
- C. the rats were not directly rewarded for making the correct turns in the maze, they were only rewarded for reaching the end of the maze.
- D. the pairing of the unconditioned stimulus and conditioned stimulus produced the conditioned response of moving correctly through the maze.

*The following information relates to Questions 38 and 39.*

Edward Thorndike studied animal intelligence using a hungry cat in a puzzle box with a fish outside the box.

**Question 38**

Thorndike's 'Law of Effect' was developed as a result of his observation that the cat

- A. was able to learn to escape the puzzle box and get the fish.
- B. accidentally pushed the lever to open the puzzle box and get the fish.
- C. spent a long time learning how to escape the puzzle box and get the fish.
- D. repeated the behaviour of pressing on the lever in order to escape the puzzle box and get the fish.

**Question 39**

In Thorndike's experiment, the fish is the \_\_\_\_\_ and the action of pushing the lever to escape the box is the \_\_\_\_\_.

- A. reinforcement; reward
- B. reward; response
- C. conditioned stimulus; conditioned response
- D. unconditioned stimulus; unconditioned response

**Question 40**

If Watson and Rayner proposed to carry out their 'Little Albert' experiment today, it is likely that an ethics committee would not approve it due to the breach of the principle of Beneficence.

In their experiment Watson and Rayner breached the principle of Beneficence by

- A. not extinguishing little Albert's fear of white fluffy objects.
- B. deceiving little Albert's mother about the nature of the experiment.
- C. publishing information about the experiment that included little Albert's name.
- D. causing distress to little Albert that was out of proportion to any gains from the experiment.

**Question 41**

Frank did well on his first mathematics topic test. Two months later, Frank completed a mathematics test on a different topic. In the second topic, Frank used the same problem-solving methods as he used for the test on the first topic. Frank did poorly on the test on the second topic.

Which of the following best explains why Frank did poorly on the test on topic 2?

- A. positive transfer of learning
- B. negative transfer of learning
- C. trial and error learning
- D. behaviour modification

**Question 42**

When Jack received a detention at school, his father took away his Playstation for a period of time. Jack's father applied

- A. punishment.
- B. negative transfer of learning.
- C. positive reinforcement.
- D. negative reinforcement.

**Question 43**

Which of the following statements is correct?

- A. In classical conditioning reinforcement occurs after the response.
- B. In operant conditioning reinforcement occurs before the response.
- C. In classical conditioning learners control their response to a stimulus.
- D. In operant conditioning learners control their response to a stimulus.

**Question 44**

Copycat crimes are criminal acts that are modelled on previous crimes which have been reported in newspapers and on television.

Which learning theory best explains copycat crimes?

- A. trial and error learning
- B. operant conditioning
- C. classical conditioning
- D. observational learning

## AREA OF STUDY 2 – LEARNING

### Question 5

A surfer who stays in the water waiting for the next good wave is being reinforced on a \_\_\_\_\_ schedule of reinforcement.

1 mark

### Question 6

Frank competes in a high-level athletics competition. On the last two occasions that he won the 100-metre race, he wore his gold chain. Frank now wears his gold chain every time that he competes, believing it to be his 'lucky chain'.

Using the language of operant conditioning, explain how Frank has learned to wear his lucky gold chain every time he races.

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3 marks

### Question 7

A phobia is an irrational and intense fear of a specific object, event or situation. When she was a child, Jan saw a large spider fall on her mother. Her mother screamed and fainted and this made Jan feel very frightened. Since that time Jan has had a phobia of spiders.

- a. In this scenario, identify the
  - i. unconditioned stimulus \_\_\_\_\_
  - ii. conditioned stimulus \_\_\_\_\_

1 + 1 = 2 marks

Jan visited a psychologist in the hope of treating her phobia.

- b. Using the language of classical conditioning, explain how the psychologist might treat Jan so she is no longer afraid of spiders.

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2 marks

- c. Using the language of classical conditioning, explain why Jan's experience with spiders may lead her to experience an irrational fear of crabs.

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1 mark

### Question 8

Vicki had not completed her Psychology homework. When she told her teacher she had not done the homework, the teacher was very angry and gave Vicki a detention. The next time Vicki had not done her homework, she lied and told her mother that she did not feel well so she could stay home from school to complete the work. She returned to school and was able to hand in the work without getting a detention. Vicki then repeated the behaviour of staying home each time she did not complete homework.

- a. What type of learning is Vicki displaying when she avoids going to school because she has not done her homework?

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1 mark

- b. Explain your answer.

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2 marks

### Question 9

Use an example to explain 'retention' in observational learning.

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2 marks

## AREA OF STUDY 3 – RESEARCH INVESTIGATION

### Background

Dr Nicholls is a psychologist interested in how the organisation of concepts in semantic memory might affect the recall of learned information. She predicts that people will recall more words from a studied list if the words are paired with words that are related in meaning.

### Experimental design

To investigate this issue, Dr Nicholls designed a memory experiment in which all participants were presented with the same list of sixty pairs of words to learn.

Half of the word pairs in the study list were **related** in meaning (for example, cat–dog, nurse–doctor, apple–orange), and the other half were **unrelated** in meaning (for example, paper–shirt, window–butter, tree–hammer).

After studying the pairs of words the participants were presented with the first word from each pair as a cue and were required to recall the second word.

Dr Nicholls determined that the results would be significant if the  $p$  value obtained was less than 0.05.

### Participants

Twenty first-year university students volunteered to participate in the experiment.

### Procedure

The experiment consisted of a study phase and a test phase.

**Study phase** – All participants were asked to read aloud each of the 60 word pairs in the study list.

- half of the participants studied the 30 **related** word pairs first, followed by the **unrelated** word pairs
- half of the participants studied the 30 **unrelated** word pairs first, followed by the **related** word pairs

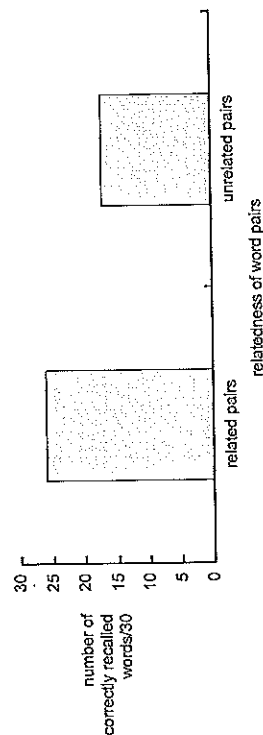
**Test phase** – The test phase immediately followed the study phase.

Participants were presented with the first word from each of the 60 word pairs as a cue for recall. Their task was to recall the word that had been paired with each cue word.

### Results

The results of Dr Nicholls' study are presented in the figure below. She conducted a statistical test to determine whether the difference between the means for the two experimental conditions was significant and found that  $p = 0.02$ .

Number of words recalled in the cued recall task



### Question 10

What are the dependent and independent variables in this experiment?

Dependent variable \_\_\_\_\_

Independent variable \_\_\_\_\_

2 marks

### Question 11

What experimental design did Dr Nicholls use?

\_\_\_\_\_

1 mark

### Question 12

The procedure for this experiment states that

- half of the participants studied the 30 **related** word pairs first, followed by the **unrelated** word pairs
  - half of the participants studied the 30 **unrelated** word pairs first, followed by the **related** word pairs
- a. What is the term for this feature of experimental design?

1 mark

- b. Why is this feature important for the experimental design used by Dr Nicholls?

2 marks

### Question 13

Write an operational hypothesis for Dr Nicholls' experiment.

2 marks

**Question 14**

Explain the findings of Dr Nicholls' experiment with reference to both the descriptive statistics provided in the graph and to the results of the statistical test.

Findings \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

3 marks

**Question 15**

a. What would be an alternative experimental design for Dr Nicholls' experiment?

\_\_\_\_\_

1 mark

b. Which design do you think is more appropriate for this study: Dr Nicholls' design or your alternative design?

\_\_\_\_\_

Provide a reason for your answer.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2 marks

**Question 16**

a. Name two ethical considerations that must be explained to participants by Dr Nicholls before the start of the experiment.

1. \_\_\_\_\_

2. \_\_\_\_\_

2 marks

b. Explain why each of these considerations is important from an ethical standpoint.

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

2 marks

END OF QUESTION AND ANSWER BOOK

# 2010 Assessment Report

## 2010 Psychology: GA 3 Written examination 2

### GENERAL COMMENTS

The mean score on the November 2010 paper was 64%, which was slightly lower than in 2009. This was mainly the result of decreased mean scores on the multiple-choice section.

The scores in the short answer section (overall mean 49% correct) were: Memory 53% correct, 48% for Learning and 47% for Research Methods. In the multiple-choice section, the mean score for Memory was 78% correct and the mean score for Learning was 77% correct.

A number of students did not answer some of the multiple-choice questions. Students are strongly encouraged to respond to each question; not only is it impossible to achieve a mark where no response is given, leaving a blank also increases the likelihood that later answers on the computer-scored sheet will be out of synchronisation and further marks may be lost. If they are unsure, students are advised to mark the response that is their 'best guess'. It is always possible to change a response by carefully erasing and re-shading. The use of a ruler, moved down the page as each question is answered, may help to ensure that the correct response line is being completed.

In the short answer section, some students failed to address command terms in the questions.

In the Research Investigation, many students gave generic answers and did not apply their knowledge to the case described. These students were therefore unable to demonstrate understanding of the concepts being assessed.

### Marking Policy

An answer that does not address all aspects of the question cannot achieve full marks. Students are reminded to read questions carefully and answer all parts of a question.

Students are advised to check their spelling because meanings must be clear and unambiguous for marks to be awarded. While spelling is not directly assessed, there are many words and phrases used in Psychology that can become ambiguous if they are spelled incorrectly.

### SPECIFIC INFORMATION

#### Section A – Multiple-choice questions

The table below indicates the percentage of students who chose each option. The correct answer is indicated by shading.

Question	% A	% B	% C	% D	Comments
Area of Study 1 – Memory					
1	90	2	6	1	
2	1	32	5	62	
3	3	1	7	88	
4	3	1	2	94	
5	96	1	1	1	
6	21	24	28	26	Deacy constitutes one of the processes by which information is lost from short-term memory (as well as from sensory and long-term memory). All students received a mark for this question.
7	16	8	70	6	
8	1	3	93	3	
9	2	2	71	25	
10	14	13	4	69	
11	71	15	9	5	
12	14	8	76	2	
13	3	10	2	85	

# 2010 Assessment Report

# 2010 Assessment Report

Question	% A	% B	% C	% D	Comments
14	6	19	11	63	It was evident that students who selected working memory (option B) did not understand Baddeley's model.
15	1	84	9	6	
16	4	13	4	78	
17	2	9	8	81	
18	86	1	2	1	
19	3	1	6	89	
20	6	3	91	1	
21	21	9	64	7	The phrase in the question 'According to semantic network theory...' should have alerted students that they were most likely to be seeking an aspect of the three characteristics of semantic network theory: nodes, links and hierarchical organisation.
22	93	6	0	1	
Area of Study 2 – Learning					
23	34	2	10	54	Many students selected option A. It is true that 'species-specific behaviour' is an alternative name for 'fixed action pattern', but this was not what the question was asking. The behaviours – often related to mating and reproduction – increase the chances of the perpetuation of the species; this is therefore a survival need.
24	1	1	2	97	The unconditioned stimulus cannot become the conditioned stimulus under any circumstances.
25	6	9	60	25	
26	91	6	1	2	
27	0	2	92	6	
28	1	4	93	2	
29	95	2	2	1	
30	89	6	3	2	
31	83	3	2	12	Students who chose option B, which referred to the timing of the consequence, appeared to assume that the question was asking why the intended punishment was ineffective.
32	7	29	7	56	
33	1	70	15	15	Option D was incorrect as there was no indication that being in the classroom was an aversive experience. The fact that the children were prevented from accessing their normal privilege and that they 'wanted to play outside' shows that the strategy was a response cost – a punishment.
34	9	19	25	47	
35	3	4	14	80	The choice of option D by over 20 per cent of students indicated a lack of understanding of both observational learning and learning set. Learning set refers to the fact that learning in one situation may affect the ability to learn in another.
36	8	4	65	23	
37	87	1	9	3	
38	10	11	4	75	
39	8	77	12	3	
40	11	6	3	80	
41	5	88	4	2	
42	87	1	1	10	
43	15	8	10	67	
44	1	2	1	96	

## Section B – Short answer questions

For each question, an outline answer (or answers) is provided. In some cases the answer given is not the only answer that could have been awarded marks.

### Area of Study 1 – Memory

#### Question 1a.

Marks	0	1	2	Average
%	20	32	48	1.3

- Semantic – names learned (for example, from hearing the roll being marked)
- Episodic – recalling names in association with class events
- Declarative – either or both of the above explanations would be valid as 'declarative' includes both 'semantic' and 'episodic'

It was necessary for students to refer to the class and/or names. A common error made by students was using 'key terms' as part of their own definition; for example, 'Declarative, because they had to declare the names of students they knew' or 'Episodic, because they had to remember episodes of their life'.

#### Question 1b.

Marks	0	1	2	Average
%	9	10	81	1.7

Condition 1: Recall (or free recall)

Condition 2: Recognition

#### Question 1c.

Marks	0	1	Average
%	51	49	0.5

Recognition is a more sensitive measure of retrieval than recall.

#### Question 1d.

Marks	0	1	2	Average
%	29	47	24	1

No, because:

- the results reflect differences in measures of retention, not differences in memory due to age
- all participants were the same age (there was no cross-age comparison)
- age was not an independent variable.

#### Question 2a.

Marks	0	1	2	Average
%	57	45	18	0.8

Forgetting is most rapid immediately after learning. The type of material learned does not affect the relative rate of forgetting.

#### Question 2b.

Marks	0	1	Average
%	60	40	0.4

Meaningful material is semantically encoded (deeper encoding than Group A). The semantic network is accessed in Group B, not in Group A.

Many students used everyday language instead of psychological terms. This caused responses to be less specific than required.

Question 3

Marks	0	1	2	3	Average
%	30	24	34	12	1.3

Encoding – The mayor should first visualise a familiar route, and then picture an item representing each important topic at a specific location along this route in the order in which she wants to recall them. For example, home to town hall, cars outside gate, recycling bins on the road, piles of rubbish in the street, pedestrian jumping off road at traffic crossing, elderly person with walking frame, and twin toddlers in pusher at town hall steps.

Retrieval – When giving the speech, the mayor can mentally move through the route, visualising and using each site along the route to cue recall of the important topics in sequential order. The various locations will act as retrieval cues for the items that have been visually linked to the locations.

For full marks it was essential that students discussed the:

- visualisation process
- method of visualising to assist encoding
- method of visualising to assist retrieval
- six items the mayor wanted to mention in her speech.

Question 4

Marks	0	1	Average
%	50	50	0.5

There may be no evidence that the memory was encoded or stored in the first instance. Consolidation may not have been completed or memory trace may not have formed. It is not possible to know whether or not cues being given relate to the memory (everybody's semantic network is different for each concept). It is virtually impossible to scientifically test for retrieval failure as a theory of forgetting (is it really forgotten?).

Many students mentioned the tip-of-the-tongue phenomenon as a criticism of this theory; however, this phenomenon supports the theory.

## Area of Study 2 – Learning

Question 5

Marks	0	1	Average
%	27	73	0.8

Partial or any specific partial schedule (variable or fixed, interval or ratio)

Question 6

Marks	0	1	2	3	Average
%	35	23	20	21	1.3

- behaviour – wearing the chain
- consequence – positive reinforcement: winning the race (feeling good because of winning)

This has increased the likelihood that Frank will repeat the behaviour of wearing the chain when he races.

Too many students tried to explain Frank's behaviour as classical conditioning, despite the wording of the question. There were many references to the chain being the stimulus and winning the race being the response, with no further attempt at using psychological language.

Question 7a-i-iii.

Marks	0	1	2	Average
%	25	33	42	1.2

Question 7a.  
Unconditioned stimulus – the mother's screaming/fainting/fear  
Conditioned stimulus – the spider(s)

Many students did not indicate that the unconditioned stimulus was the mother's fear.

Question 7b.

Marks	0	1	2	Average
%	44	41	15	0.7

- The therapist could gradually extinguish Jan's conditioned response of fear of spiders by presenting stimuli similar to spiders (pictures/models, etc.), without ever pairing the stimulus with an unconditioned stimulus that generates the reflexive response of fear.
- The psychologist could associate the spider with an unconditioned stimulus that causes a reflexive response of pleasure or relaxation (chocolate/cute puppy), so that the spider stimulus changes to become a conditioned stimulus eliciting the conditioned response of pleasure.

Some students used the terms 'graduated exposure', 'systematic desensitisation' or 'flooding' appropriately; however, these terms were not required in order to gain marks. A generic response, however, could not achieve full marks. Many students incorrectly identified the process as aversion therapy.

Question 7c.

Marks	0	1	Average
%	16	84	0.9

Stimulus generalisation (a stimulus similar in nature to the conditioned stimulus of spiders produces the conditioned response – fear of the crab)

Question 8a.

Marks	0	1	Average
%	60	40	0.4

Either of:

- operant conditioning
- avoidance learning.

A common error was to identify the process as 'one-trial learning'; however, it should be emphasised that the study design specifies one-trial learning in the form of taste aversion.

Question 8b.

Marks	0	1	2	Average
%	36	31	34	1

- Her behaviour of going to school without having done her homework was punished, so the behaviour was not repeated.
- Her behaviour of staying at home (when she has not completed her homework) is reinforced because she feels good about avoiding detention.
- Her behaviour of staying at home (when she has not completed her homework) is reinforced because it avoids the unpleasant consequence of detention.



Question 9

Marks	0	1	2	Average
%	48	40	12	0.7

Retention occurs when the learner stores a mental representation (memory) of the observed behaviour and its consequences.

Any example was acceptable, but needed to include storing a mental representation (or remembering the process) of the observed behaviour.

### Area of Study 3 – Research Investigation

Question 10

Marks	0	1	2	Average
%	27	20	52	1.3

Dependent variable: Recall or number of words correctly recalled.  
Independent variable: Relatedness of word pairs (related or unrelated)

Many students interpreted the description of the independent variable incorrectly as 'related word pairs first followed by unrelated', compared with 'unrelated word pairs first followed by related'. Many students identified the independent variable as related versus unrelated words, rather than word pairs.

Question 11

Marks	0	1	Average
%	49	51	0.5

The experimental design used by Dr Nicholls was repeated measures (within subjects).

Question 12a

Marks	0	1	Average
%	63	37	0.4

The term for this feature of experimental design is counterbalancing.

Students who had not identified the experimental design correctly in Question 11 were unlikely to provide a correct response to this question as counterbalancing is most frequently associated with repeated measures designs.

Question 12b

Marks	0	1	2	Average
%	62	19	20	0.6

Counterbalancing eliminates the confounding influence of order effects such as learning (practice) effects and/or boredom effects.

Students who had not correctly identified repeated measures (Question 11) and counterbalancing (Question 12a) were unlikely to be able to achieve any marks for this question.

Question 13

Marks	0	1	2	Average
%	30	57	13	0.9

Either of:

- people will show better recall – operationalised as number of words recalled from a list of pairs in a related word-pair condition compared to an unrelated word-pair condition
- people who learn related pairs of words will show improved memory – operationalised as number of words recalled from a list of 30 pairs – compared to people who learn unrelated word pairs.

An operational hypothesis is a stated prediction of the outcome of the experiment that includes:

- statement of the population (not significant in this response)
- statement of the independent variable (IV)

- statement of the dependent variable (DV)
- operationalisation of the dependent variable.

(If the independent variable was also continuous, then it would also be operationalised.)

A correct response included appropriate operationalisation of the dependent variable and statement of the population, the independent variable and dependent variable.

Students needed to demonstrate their understanding of the concept of operationalisation and their understanding that a hypothesis is a statement of the predicted effect of a change in the independent variable on the value of the dependent variable. Students are reminded that a hypothesis cannot be expressed as a question and that it need not be directional; '... relatedness of word pairs will affect memory ability ...' is appropriate. Population was not significant in this response.

Question 14

Marks	0	1	2	3	Average
%	15	28	38	19	1.6

Recall for related word pairs (mean = 25/30)

Recall for unrelated word pairs (mean = 17/30)

$P < .05$  – the difference in the means is statistically significant ( $p = .02$ )

It was evident that many students misunderstood the meaning of ' $p < .05$ '. It does not mean 'Fewer than 5 times in 100 this result will occur by chance', it means 'The probability that this difference would occur by chance alone is less than 5 per cent'. Students must be aware that 'statistical significance' is the term required and that 'significance' is a different concept.

Question 15a

Marks	0	1	Average
%	26	74	0.8

Either of:

- independent groups
- matched participants.

Question 15b

Marks	0	1	2	Average
%	22	40	37	1.2

An advantage (or a disadvantage) of one design compared with another.

Independent groups

- advantage: all measures taken at the same time – less time involved
- disadvantage: need large numbers of participants

Matched participants

- advantage: controls variables on which participants are matched (compared with independent groups) and there is no need for counterbalancing (compared with repeated measures)
- disadvantage: time taken in measuring the matching variable, and drop-outs – if one of a pair drops out, it eliminates the scores of both members of the pair.

Students could choose either of the alternative research designs.

Question 16a

Marks	0	1	2	Average
%	16	56	28	1.1

Two of:		<ul style="list-style-type: none"> <li>possible harm/risk to participants</li> <li>withdrawal rights</li> <li>confidentiality of data</li> <li>voluntary participation.</li> </ul>	
Question 16b.			
Marks	0	1	2
%	73	23	4
Two of:		<ul style="list-style-type: none"> <li>no psychological or physiological harm to participants</li> <li>no invasion of personal privacy, which can cause stress</li> <li>no coercion, which can place participants under duress.</li> </ul>	
It was necessary for students to provide a response that corresponded with the ethical considerations listed in Question 16a.			
Debriefing takes place after research has concluded and conclusions have been drawn. Many students indicated that participants should be told what would be involved in the research, implying incorrectly that debriefing occurs before the research.			